Release notes for ENDF/B Development n-040_Zr_090 evaluation

April 26, 2017

- `psyche` Warnings:

1. Gamma width not in agreement with PSYCHE's expectations
   *FILE 2 / SECTION 151 / ISOTOPE MASS = 90. L = 0 / AT RESONANCE
   ENERGY 3.53560E+04 EV. THE GAMMA WIDTH 5.90000E-01 DEVIATES TOO
   MUCH FROM THE AVERAGE 1.55240E-01 (0): Gamma width*

   ```
   FILE  2
      SECTION 151
         ISOTOPE MASS =  90. L =  0
                     AT RESONANCE ENERGY  3.53560E+04 EV. THE GAMMA WIDTH  5.90000E-01 DEVIATES TOO MUCH FROM THE AV
   ```

2. Gamma width not in agreement with PSYCHE's expectations
   *FILE 2 / SECTION 151 / ISOTOPE MASS = 90. L = 0 / AT RESONANCE
   ENERGY 5.32640E+04 EV. THE GAMMA WIDTH 2.50000E-02 DEVIATES TOO
   MUCH FROM THE AVERAGE 1.55240E-01 (0): Gamma width*

   ```
   FILE  2
      SECTION 151
         ISOTOPE MASS =  90. L =  0
                     AT RESONANCE ENERGY  5.32640E+04 EV. THE GAMMA WIDTH  2.50000E-02 DEVIATES TOO MUCH FROM THE AV
   ```

3. Gamma width not in agreement with PSYCHE's expectations
   *FILE 2 / SECTION 151 / ISOTOPE MASS = 90. L = 1 / AT RESONANCE
   ENERGY 1.68940E+04 EV. THE GAMMA WIDTH 9.90000E-02 DEVIATES TOO
   MUCH FROM THE AVERAGE 3.09881E-01 (0): Gamma width*

   ```
   FILE  2
      SECTION 151
         ISOTOPE MASS =  90. L =  1
                     AT RESONANCE ENERGY  1.68940E+04 EV. THE GAMMA WIDTH  9.90000E-02 DEVIATES TOO MUCH FROM THE AV
   ```

4. Gamma width not in agreement with PSYCHE's expectations
   *FILE 2 / SECTION 151 / ISOTOPE MASS = 90. L = 1 / AT RESONANCE
   ENERGY 1.90790E+04 EV. THE GAMMA WIDTH 2.00000E-02 DEVIATES TOO
   MUCH FROM THE AVERAGE 3.09881E-01 (0): Gamma width*

   ```
   FILE  2
      SECTION 151
         ISOTOPE MASS =  90. L =  1
                     AT RESONANCE ENERGY  1.90790E+04 EV. THE GAMMA WIDTH  2.00000E-02 DEVIATES TOO MUCH FROM THE AV
   ```

5. Gamma width not in agreement with PSYCHE's expectations
   *FILE 2 / SECTION 151 / ISOTOPE MASS = 90. L = 1 / AT RESONANCE
   ENERGY 2.64690E+04 EV. THE GAMMA WIDTH 6.50000E-02 DEVIATES TOO
   MUCH FROM THE AVERAGE 3.09881E-01 (0): Gamma width*

   ```
   FILE  2
      SECTION 151
         ISOTOPE MASS =  90. L =  1
                     AT RESONANCE ENERGY  2.64690E+04 EV. THE GAMMA WIDTH  6.50000E-02 DEVIATES TOO MUCH FROM THE AV
   ```

6. Gamma width not in agreement with PSYCHE's expectations
   *FILE 2 / SECTION 151 / ISOTOPE MASS = 90. L = 1 / AT RESONANCE
   ENERGY 4.13900E+04 EV. THE GAMMA WIDTH 9.80000E-01 DEVIATES TOO
   MUCH FROM THE AVERAGE 3.09881E-01 (0): Gamma width*

```
        FILE  2
           SECTION 151
              ISOTOPE MASS =  90. L =  1
                        AT RESONANCE ENERGY  4.13900E+04 EV. THE GAMMA WIDTH  9.80000E-01 DEVIATES TOO MUCH FROM THE AV
```

7. Gamma width not in agreement with PSYCHE's expectations
   FILE 2 / SECTION 151 / ISOTOPE MASS = 90. L = 1 / AT RESONANCE
   ENERGY 6.49500E+04 EV. THE GAMMA WIDTH 7.90000E-02 DEVIATES TOO
   MUCH FROM THE AVERAGE 3.09881E-01 (0): Gamma width

```
        FILE  2
           SECTION 151
              ISOTOPE MASS =  90. L =  1
                        AT RESONANCE ENERGY  6.49500E+04 EV. THE GAMMA WIDTH  7.90000E-02 DEVIATES TOO MUCH FROM THE AV
```

8. Gamma width not in agreement with PSYCHE's expectations
   FILE 2 / SECTION 151 / ISOTOPE MASS = 90. L = 1 / AT RESONANCE
   ENERGY 1.66300E+05 EV. THE GAMMA WIDTH 1.40000E+00 DEVIATES TOO
   MUCH FROM THE AVERAGE 3.09881E-01 (0): Gamma width

```
        FILE  2
           SECTION 151
              ISOTOPE MASS =  90. L =  1
                        AT RESONANCE ENERGY  1.66300E+05 EV. THE GAMMA WIDTH  1.40000E+00 DEVIATES TOO MUCH FROM THE AV
```

9. Gamma width not in agreement with PSYCHE's expectations
   FILE 2 / SECTION 151 / ISOTOPE MASS = 90. L = 1 / AT RESONANCE
   ENERGY 1.72400E+05 EV. THE GAMMA WIDTH 1.33000E+00 DEVIATES TOO
   MUCH FROM THE AVERAGE 3.09881E-01 (0): Gamma width

```
        FILE  2
           SECTION 151
              ISOTOPE MASS =  90. L =  1
                        AT RESONANCE ENERGY  1.72400E+05 EV. THE GAMMA WIDTH  1.33000E+00 DEVIATES TOO MUCH FROM THE AV
```

10. Gamma width not in agreement with PSYCHE's expectations
    FILE 2 / SECTION 151 / ISOTOPE MASS = 90. L = 2 / AT RESONANCE
    ENERGY 7.60000E+04 EV. THE GAMMA WIDTH 1.00000E-02 DEVIATES TOO
    MUCH FROM THE AVERAGE 9.26667E-02 (0): Gamma width

```
        FILE  2
           SECTION 151
              ISOTOPE MASS =  90. L =  2
                        AT RESONANCE ENERGY  7.60000E+04 EV. THE GAMMA WIDTH  1.00000E-02 DEVIATES TOO MUCH FROM THE AV
```

11. Gamma width not in agreement with PSYCHE's expectations
    FILE 2 / SECTION 151 / ISOTOPE MASS = 90. L = 2 / AT RESONANCE
    ENERGY 7.96800E+04 EV. THE GAMMA WIDTH 1.00000E-02 DEVIATES TOO
    MUCH FROM THE AVERAGE 9.26667E-02 (0): Gamma width

```
        FILE  2
           SECTION 151
              ISOTOPE MASS =  90. L =  2
                        AT RESONANCE ENERGY  7.96800E+04 EV. THE GAMMA WIDTH  1.00000E-02 DEVIATES TOO MUCH FROM THE AV
```

12. Gamma width not in agreement with PSYCHE's expectations
    FILE 2 / SECTION 151 / ISOTOPE MASS = 90. L = 2 / AT RESONANCE

ENERGY 8.01600E+04 EV. THE GAMMA WIDTH 1.00000E-02 DEVIATES TOO
MUCH FROM THE AVERAGE 9.26667E-02 (0): Gamma width

```
FILE  2
   SECTION 151
      ISOTOPE MASS =  90. L =  2
                AT RESONANCE ENERGY  8.01600E+04 EV. THE GAMMA WIDTH  1.00000E-02 DEVIATES TOO MUCH FROM THE AV
```

13. Gamma width not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ISOTOPE MASS = 90. L = 2 / AT RESONANCE
ENERGY 9.65000E+04 EV. THE GAMMA WIDTH 1.00000E-02 DEVIATES TOO
MUCH FROM THE AVERAGE 9.26667E-02 (0): Gamma width

```
FILE  2
   SECTION 151
      ISOTOPE MASS =  90. L =  2
                AT RESONANCE ENERGY  9.65000E+04 EV. THE GAMMA WIDTH  1.00000E-02 DEVIATES TOO MUCH FROM THE AV
```

14. Gamma width not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ISOTOPE MASS = 90. L = 2 / AT RESONANCE
ENERGY 1.04700E+05 EV. THE GAMMA WIDTH 1.00000E-02 DEVIATES TOO
MUCH FROM THE AVERAGE 9.26667E-02 (0): Gamma width

```
FILE  2
   SECTION 151
      ISOTOPE MASS =  90. L =  2
                AT RESONANCE ENERGY  1.04700E+05 EV. THE GAMMA WIDTH  1.00000E-02 DEVIATES TOO MUCH FROM THE AV
```

15. Gamma width not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ISOTOPE MASS = 90. L = 2 / AT RESONANCE
ENERGY 1.08300E+05 EV. THE GAMMA WIDTH 1.00000E-02 DEVIATES TOO
MUCH FROM THE AVERAGE 9.26667E-02 (0): Gamma width

```
FILE  2
   SECTION 151
      ISOTOPE MASS =  90. L =  2
                AT RESONANCE ENERGY  1.08300E+05 EV. THE GAMMA WIDTH  1.00000E-02 DEVIATES TOO MUCH FROM THE AV
```

16. Gamma width not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ISOTOPE MASS = 90. L = 2 / AT RESONANCE
ENERGY 1.45400E+05 EV. THE GAMMA WIDTH 1.00000E-02 DEVIATES TOO
MUCH FROM THE AVERAGE 9.26667E-02 (0): Gamma width

```
FILE  2
   SECTION 151
      ISOTOPE MASS =  90. L =  2
                AT RESONANCE ENERGY  1.45400E+05 EV. THE GAMMA WIDTH  1.00000E-02 DEVIATES TOO MUCH FROM THE AV
```

17. Gamma width not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ISOTOPE MASS = 90. L = 2 / AT RESONANCE
ENERGY 1.48300E+05 EV. THE GAMMA WIDTH 1.00000E-02 DEVIATES TOO
MUCH FROM THE AVERAGE 9.26667E-02 (0): Gamma width

```
FILE  2
   SECTION 151
      ISOTOPE MASS =  90. L =  2
                AT RESONANCE ENERGY  1.48300E+05 EV. THE GAMMA WIDTH  1.00000E-02 DEVIATES TOO MUCH FROM THE AV
```

18. Gamma width not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ISOTOPE MASS = 90. L = 2 / AT RESONANCE ENERGY 1.60000E+05 EV. THE GAMMA WIDTH 1.00000E-02 DEVIATES TOO MUCH FROM THE AVERAGE 9.26667E-02 (0): Gamma width

```
FILE  2
   SECTION 151
       ISOTOPE MASS =  90. L =  2
                   AT RESONANCE ENERGY  1.60000E+05 EV. THE GAMMA WIDTH  1.00000E-02 DEVIATES TOO MUCH FROM THE AV
```

19. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 2.00000E+05. STRENGTH FUNCTION IS 3.50000E-04 / ENERGY = 2.00000E+05. STRENGTH FUNCTION IS 3.50000E-04 / DENSITY 5.01072E+03 SHOULD BE 4.32796E+03 (0): URR dens. (a)

```
FILE  2
   SECTION 151
       ENERGY =  2.00000E+05. STRENGTH FUNCTION IS  3.50000E-04
                ENERGY =  2.00000E+05. STRENGTH FUNCTION IS  3.50000E-04
                          DENSITY  5.01072E+03 SHOULD BE  4.32796E+03
```

20. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 3.00000E+05. STRENGTH FUNCTION IS 3.50000E-04 / DENSITY 4.52203E+03 SHOULD BE 3.90585E+03 (0): URR dens. (a)

```
FILE  2
   SECTION 151
          ENERGY =  3.00000E+05. STRENGTH FUNCTION IS  3.50000E-04
                    DENSITY  4.52203E+03 SHOULD BE  3.90585E+03
```

21. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 4.00000E+05. STRENGTH FUNCTION IS 3.50000E-04 / DENSITY 4.08376E+03 SHOULD BE 3.52731E+03 (0): URR dens. (a)

```
FILE  2
   SECTION 151
          ENERGY =  4.00000E+05. STRENGTH FUNCTION IS  3.50000E-04
                    DENSITY  4.08376E+03 SHOULD BE  3.52731E+03
```

22. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 5.00000E+05. STRENGTH FUNCTION IS 3.50000E-04 / DENSITY 3.69041E+03 SHOULD BE 3.18755E+03 (0): URR dens. (a)

```
FILE  2
   SECTION 151
          ENERGY =  5.00000E+05. STRENGTH FUNCTION IS  3.50000E-04
                    DENSITY  3.69041E+03 SHOULD BE  3.18755E+03
```

23. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 6.00000E+05. STRENGTH FUNCTION IS 3.50000E-04 / DENSITY 3.33710E+03 SHOULD BE 2.88239E+03 (0): URR dens. (a)

```
FILE  2
   SECTION 151
          ENERGY =  6.00000E+05. STRENGTH FUNCTION IS  3.50000E-04
                    DENSITY  3.33710E+03 SHOULD BE  2.88239E+03
```

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24. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 7.00000E+05. STRENGTH FUNCTION IS 3.50000E-04 / DENSITY 3.01954E+03 SHOULD BE 2.60809E+03 (0): URR dens. (a)

```
FILE  2
   SECTION 151
         ENERGY =  7.00000E+05. STRENGTH FUNCTION IS  3.50000E-04
                        DENSITY  3.01954E+03 SHOULD BE  2.60809E+03
```

25. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 8.00000E+05. STRENGTH FUNCTION IS 3.50000E-04 / DENSITY 2.73390E+03 SHOULD BE 2.36137E+03 (0): URR dens. (a)

```
FILE  2
   SECTION 151
         ENERGY =  8.00000E+05. STRENGTH FUNCTION IS  3.50000E-04
                        DENSITY  2.73390E+03 SHOULD BE  2.36137E+03
```

26. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 9.00000E+05. STRENGTH FUNCTION IS 3.50000E-04 / DENSITY 2.47679E+03 SHOULD BE 2.13930E+03 (0): URR dens. (a)

```
FILE  2
   SECTION 151
         ENERGY =  9.00000E+05. STRENGTH FUNCTION IS  3.50000E-04
                        DENSITY  2.47679E+03 SHOULD BE  2.13930E+03
```

27. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 1.00000E+06. STRENGTH FUNCTION IS 3.50000E-04 / DENSITY 2.24521E+03 SHOULD BE 1.93927E+03 (0): URR dens. (a)

```
FILE  2
   SECTION 151
         ENERGY =  1.00000E+06. STRENGTH FUNCTION IS  3.50000E-04
                        DENSITY  2.24521E+03 SHOULD BE  1.93927E+03
```

28. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 1.10000E+06. STRENGTH FUNCTION IS 3.50000E-04 / DENSITY 2.03648E+03 SHOULD BE 1.75898E+03 (0): URR dens. (a)

```
FILE  2
   SECTION 151
         ENERGY =  1.10000E+06. STRENGTH FUNCTION IS  3.50000E-04
                        DENSITY  2.03648E+03 SHOULD BE  1.75898E+03
```

29. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 1.20000E+06. STRENGTH FUNCTION IS 3.50000E-04 / DENSITY 1.84821E+03 SHOULD BE 1.59638E+03 (0): URR dens. (a)

```
FILE  2
   SECTION 151
         ENERGY =  1.20000E+06. STRENGTH FUNCTION IS  3.50000E-04
                        DENSITY  1.84821E+03 SHOULD BE  1.59638E+03
```

30. Level density in URR not in agreement with PSYCHE's expectations
    FILE 2 / SECTION 151 / ENERGY = 1.30000E+06. STRENGTH FUNCTION IS 3.50000E-04 / DENSITY 1.67831E+03 SHOULD BE 1.44962E+03 (0): URR dens. (a)

```
FILE  2
   SECTION 151
           ENERGY =  1.30000E+06. STRENGTH FUNCTION IS  3.50000E-04
                           DENSITY  1.67831E+03 SHOULD BE  1.44962E+03
```

31. Level density in URR not in agreement with PSYCHE's expectations
    FILE 2 / SECTION 151 / ENERGY = 1.40000E+06. STRENGTH FUNCTION IS 3.50000E-04 / DENSITY 1.52487E+03 SHOULD BE 1.31709E+03 (0): URR dens. (a)

```
FILE  2
   SECTION 151
           ENERGY =  1.40000E+06. STRENGTH FUNCTION IS  3.50000E-04
                           DENSITY  1.52487E+03 SHOULD BE  1.31709E+03
```

32. Level density in URR not in agreement with PSYCHE's expectations
    FILE 2 / SECTION 151 / ENERGY = 1.50000E+06. STRENGTH FUNCTION IS 3.50000E-04 / DENSITY 1.38622E+03 SHOULD BE 1.19733E+03 (0): URR dens. (a)

```
FILE  2
   SECTION 151
           ENERGY =  1.50000E+06. STRENGTH FUNCTION IS  3.50000E-04
                           DENSITY  1.38622E+03 SHOULD BE  1.19733E+03
```

33. Level density in URR not in agreement with PSYCHE's expectations
    FILE 2 / SECTION 151 / ENERGY = 1.60000E+06. STRENGTH FUNCTION IS 3.50000E-04 / DENSITY 1.26085E+03 SHOULD BE 1.08905E+03 (0): URR dens. (a)

```
FILE  2
   SECTION 151
           ENERGY =  1.60000E+06. STRENGTH FUNCTION IS  3.50000E-04
                           DENSITY  1.26085E+03 SHOULD BE  1.08905E+03
```

34. Level density in URR not in agreement with PSYCHE's expectations
    FILE 2 / SECTION 151 / ENERGY = 1.70000E+06. STRENGTH FUNCTION IS 3.50000E-04 / DENSITY 1.14742E+03 SHOULD BE 9.91076E+02 (0): URR dens. (a)

```
FILE  2
   SECTION 151
           ENERGY =  1.70000E+06. STRENGTH FUNCTION IS  3.50000E-04
                           DENSITY  1.14742E+03 SHOULD BE  9.91076E+02
```

35. Level density in URR not in agreement with PSYCHE's expectations
    FILE 2 / SECTION 151 / ENERGY = 1.78046E+06. STRENGTH FUNCTION IS 3.50000E-04 / DENSITY 1.06402E+03 SHOULD BE 9.19031E+02 (0): URR dens. (a)

```
FILE  2
   SECTION 151
           ENERGY =  1.78046E+06. STRENGTH FUNCTION IS  3.50000E-04
                           DENSITY  1.06402E+03 SHOULD BE  9.19031E+02
```

36. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 2.00000E+05. STRENGTH FUNCTION IS 1.50000E-04 / ENERGY = 2.00000E+05. STRENGTH FUNCTION IS 1.50000E-04 / DENSITY 4.26420E+03 SHOULD BE 3.34048E+03 (0): URR dens. (a)

```
FILE  2
   SECTION 151
         ENERGY =  2.00000E+05. STRENGTH FUNCTION IS  1.50000E-04
                   ENERGY =  2.00000E+05. STRENGTH FUNCTION IS  1.50000E-04
                              DENSITY  4.26420E+03 SHOULD BE  3.34048E+03
```

37. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 3.00000E+05. STRENGTH FUNCTION IS 1.50000E-04 / DENSITY 3.84832E+03 SHOULD BE 3.01469E+03 (0): URR dens. (a)

```
FILE  2
   SECTION 151
         ENERGY =  3.00000E+05. STRENGTH FUNCTION IS  1.50000E-04
                    DENSITY  3.84832E+03 SHOULD BE  3.01469E+03
```

38. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 4.00000E+05. STRENGTH FUNCTION IS 1.50000E-04 / DENSITY 3.47535E+03 SHOULD BE 2.72251E+03 (0): URR dens. (a)

```
FILE  2
   SECTION 151
         ENERGY =  4.00000E+05. STRENGTH FUNCTION IS  1.50000E-04
                    DENSITY  3.47535E+03 SHOULD BE  2.72251E+03
```

39. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 5.00000E+05. STRENGTH FUNCTION IS 1.50000E-04 / DENSITY 3.14060E+03 SHOULD BE 2.46027E+03 (0): URR dens. (a)

```
FILE  2
   SECTION 151
         ENERGY =  5.00000E+05. STRENGTH FUNCTION IS  1.50000E-04
                    DENSITY  3.14060E+03 SHOULD BE  2.46027E+03
```

40. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 6.00000E+05. STRENGTH FUNCTION IS 1.50000E-04 / DENSITY 2.83993E+03 SHOULD BE 2.22474E+03 (0): URR dens. (a)

```
FILE  2
   SECTION 151
         ENERGY =  6.00000E+05. STRENGTH FUNCTION IS  1.50000E-04
                    DENSITY  2.83993E+03 SHOULD BE  2.22474E+03
```

41. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 7.00000E+05. STRENGTH FUNCTION IS 1.50000E-04 / DENSITY 2.56968E+03 SHOULD BE 2.01303E+03 (0): URR dens. (a)

```
FILE  2
   SECTION 151
         ENERGY =  7.00000E+05. STRENGTH FUNCTION IS  1.50000E-04
                    DENSITY  2.56968E+03 SHOULD BE  2.01303E+03
```

42. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 8.00000E+05. STRENGTH FUNCTION IS 1.50000E-04 / DENSITY 2.32659E+03 SHOULD BE 1.82260E+03 (0): URR dens. (a)

```
FILE  2
   SECTION 151
          ENERGY =  8.00000E+05. STRENGTH FUNCTION IS  1.50000E-04
                         DENSITY  2.32659E+03 SHOULD BE  1.82260E+03
```

43. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 9.00000E+05. STRENGTH FUNCTION IS 1.50000E-04 / DENSITY 2.10779E+03 SHOULD BE 1.65119E+03 (0): URR dens. (a)

```
FILE  2
   SECTION 151
          ENERGY =  9.00000E+05. STRENGTH FUNCTION IS  1.50000E-04
                         DENSITY  2.10779E+03 SHOULD BE  1.65119E+03
```

44. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 1.00000E+06. STRENGTH FUNCTION IS 1.50000E-04 / DENSITY 1.91071E+03 SHOULD BE 1.49681E+03 (0): URR dens. (a)

```
FILE  2
   SECTION 151
          ENERGY =  1.00000E+06. STRENGTH FUNCTION IS  1.50000E-04
                         DENSITY  1.91071E+03 SHOULD BE  1.49681E+03
```

45. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 1.10000E+06. STRENGTH FUNCTION IS 1.50000E-04 / DENSITY 1.73307E+03 SHOULD BE 1.35765E+03 (0): URR dens. (a)

```
FILE  2
   SECTION 151
          ENERGY =  1.10000E+06. STRENGTH FUNCTION IS  1.50000E-04
                         DENSITY  1.73307E+03 SHOULD BE  1.35765E+03
```

46. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 1.20000E+06. STRENGTH FUNCTION IS 1.50000E-04 / DENSITY 1.57286E+03 SHOULD BE 1.23214E+03 (0): URR dens. (a)

```
FILE  2
   SECTION 151
          ENERGY =  1.20000E+06. STRENGTH FUNCTION IS  1.50000E-04
                         DENSITY  1.57286E+03 SHOULD BE  1.23214E+03
```

47. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 1.30000E+06. STRENGTH FUNCTION IS 1.50000E-04 / DENSITY 1.42827E+03 SHOULD BE 1.11887E+03 (0): URR dens. (a)

```
FILE  2
   SECTION 151
          ENERGY =  1.30000E+06. STRENGTH FUNCTION IS  1.50000E-04
                         DENSITY  1.42827E+03 SHOULD BE  1.11887E+03
```

48. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 1.40000E+06. STRENGTH FUNCTION IS 1.50000E-04 / DENSITY 1.29769E+03 SHOULD BE 1.01658E+03 (0): URR dens. (a)

```
FILE  2
   SECTION 151
         ENERGY =  1.40000E+06. STRENGTH FUNCTION IS  1.50000E-04
                        DENSITY  1.29769E+03 SHOULD BE  1.01658E+03
```

49. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 1.50000E+06. STRENGTH FUNCTION IS 1.50000E-04 / DENSITY 1.17969E+03 SHOULD BE 9.24145E+02 (0): URR dens. (a)

```
FILE  2
   SECTION 151
         ENERGY =  1.50000E+06. STRENGTH FUNCTION IS  1.50000E-04
                        DENSITY  1.17969E+03 SHOULD BE  9.24145E+02
```

50. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 1.60000E+06. STRENGTH FUNCTION IS 1.50000E-04 / DENSITY 1.07300E+03 SHOULD BE 8.40567E+02 (0): URR dens. (a)

```
FILE  2
   SECTION 151
         ENERGY =  1.60000E+06. STRENGTH FUNCTION IS  1.50000E-04
                        DENSITY  1.07300E+03 SHOULD BE  8.40567E+02
```

51. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 1.70000E+06. STRENGTH FUNCTION IS 1.50000E-04 / DENSITY 9.76476E+02 SHOULD BE 7.64949E+02 (0): URR dens. (a)

```
FILE  2
   SECTION 151
         ENERGY =  1.70000E+06. STRENGTH FUNCTION IS  1.50000E-04
                        DENSITY  9.76476E+02 SHOULD BE  7.64949E+02
```

52. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 1.78046E+06. STRENGTH FUNCTION IS 1.50000E-04 / DENSITY 9.05493E+02 SHOULD BE 7.09343E+02 (0): URR dens. (a)

```
FILE  2
   SECTION 151
         ENERGY =  1.78046E+06. STRENGTH FUNCTION IS  1.50000E-04
                        DENSITY  9.05493E+02 SHOULD BE  7.09343E+02
```

- `fudge-4.0` Warnings:

   1. Missing a channel with a particular angular momenta combination
   resonances / resolved / MultiLevel_BreitWigner (Error # 0): missingResonanceChannel

```
WARNING: Missing a channel with angular momenta combination L = 0, J = 1.5 and S = 1.5 for "capture"
WARNING: Missing a channel with angular momenta combination L = 1, J = 0.5 and S = 1.5 for "capture"
WARNING: Missing a channel with angular momenta combination L = 1, J = 1.5 and S = 1.5 for "capture"
WARNING: Missing a channel with angular momenta combination L = 1, J = 2.5 and S = 1.5 for "capture"
        ... plus 4 more instances of this message
```

2. Cross section does not match sum of linked reaction cross sections
   crossSectionSum label 0: total (Error # 0): CS Sum.

   ```
   WARNING: Cross section does not match sum of linked reaction cross sections! Max diff: 0.32%
   ```

3. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
   Section 1 (n + Zr90): / Form 'eval': / Component 1 (Error # 0): Condition num.

   ```
   WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small
   ```

4. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
   Section 1 (n + Zr90): / Form 'eval': / Component 2 (Error # 0): Condition num.

   ```
   WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small
   ```

5. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
   Section 2 ((z,n)): / Form 'eval': (Error # 0): Condition num.

   ```
   WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small
   ```

6. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
   Section 3 (n[multiplicity:'2'] + Zr89 + gamma): / Form 'eval': (Error # 0): Condition num.

   ```
   WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small
   ```

7. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
   Section 4 (Zr91 + gamma): / Form 'eval': / Component 1 (Error # 0): Condition num.

   ```
   WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small
   ```

- `fudge-4.0` Errors:

  1. Calculated and tabulated Q values disagree.
     reaction label 11: n[multiplicity:'2'] + Zr89 + gamma (Error # 0): Q mismatch

     ```
     WARNING: Calculated and tabulated Q-values disagree: -11950770.57832336 eV vs -1.197e7 eV!
     ```

  2. Calculated and tabulated Q values disagree.
     reaction label 12: n + H1 + Y89 + gamma (Error # 0): Q mismatch

     ```
     WARNING: Calculated and tabulated Q-values disagree: -8335109.927215576 eV vs -6.131e6 eV!
     ```

  3. Calculated and tabulated Q values disagree.
     reaction label 13: H1 + Y90 (Error # 0): Q mismatch

     ```
     WARNING: Calculated and tabulated Q-values disagree: -1478079.753952026 eV vs -1.498e6 eV!
     ```

  4. Calculated and tabulated Q values disagree.
     reaction label 14: H1 + Y90_e1 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -1680579.753952026 eV vs -1.7005e6 eV!
```

5. Calculated and tabulated Q values disagree.
   reaction label 15: H1 + Y90_e2 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -2159749.753952026 eV vs -2179670. eV!
```

6. Calculated and tabulated Q values disagree.
   reaction label 16: H1 + Y90_e3 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -2254679.753952026 eV vs -2.2746e6 eV!
```

7. Calculated and tabulated Q values disagree.
   reaction label 17: H1 + Y90_e4 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -2431599.753952026 eV vs -2451520. eV!
```

8. Calculated and tabulated Q values disagree.
   reaction label 18: H1 + Y90_e5 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -2524949.753952026 eV vs -2544870. eV!
```

9. Calculated and tabulated Q values disagree.
   reaction label 19: H1 + Y90_e6 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -2667769.753952026 eV vs -2687690. eV!
```

10. Calculated and tabulated Q values disagree.
    reaction label 20: H1 + Y90_e7 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -2689669.753952026 eV vs -2709590. eV!
```

11. Calculated and tabulated Q values disagree.
    reaction label 21: H1 + Y90_e8 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -2776279.753952026 eV vs -2.7962e6 eV!
```

12. Calculated and tabulated Q values disagree.
    reaction label 22: H1 + Y90_e9 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -2849219.753952026 eV vs -2869140. eV!
```

13. Calculated and tabulated Q values disagree.
    reaction label 23: H1 + Y90_e10 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -2894669.753952026 eV vs -2914590. eV!
```

14. Calculated and tabulated Q values disagree.
    reaction label 24: H1 + Y90_e11 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -3039979.753952026 eV vs -3.0599e6 eV!
```

15. Calculated and tabulated Q values disagree.
    reaction label 25: H1 + (Y90_c -> Y90 + gamma) (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -3039979.753952026 eV vs -3.0599e6 eV!
```

16. Calculated and tabulated Q values disagree.
    reaction label 26: He4 + Sr87 (Error # 0): Q mismatch

    ```
    WARNING: Calculated and tabulated Q-values disagree: 1779713.284729004 eV vs 1.756e6 eV!
    ```

17. Calculated and tabulated Q values disagree.
    reaction label 27: He4 + Sr87_e1 (Error # 0): Q mismatch

    ```
    WARNING: Calculated and tabulated Q-values disagree: 1391183.284729004 eV vs 1367470. eV!
    ```

18. Calculated and tabulated Q values disagree.
    reaction label 28: He4 + Sr87_e2 (Error # 0): Q mismatch

    ```
    WARNING: Calculated and tabulated Q-values disagree: 906373.2847290039 eV vs 882660. eV!
    ```

19. Calculated and tabulated Q values disagree.
    reaction label 29: He4 + Sr87_e3 (Error # 0): Q mismatch

    ```
    WARNING: Calculated and tabulated Q-values disagree: 551293.2847290039 eV vs 527580. eV!
    ```

20. Calculated and tabulated Q values disagree.
    reaction label 30: He4 + Sr87_e4 (Error # 0): Q mismatch

    ```
    WARNING: Calculated and tabulated Q-values disagree: 525773.2847290039 eV vs 502060. eV!
    ```

21. Calculated and tabulated Q values disagree.
    reaction label 31: He4 + Sr87_e5 (Error # 0): Q mismatch

    ```
    WARNING: Calculated and tabulated Q-values disagree: 39713.28472900391 eV vs 1.6e4 eV!
    ```

22. Calculated and tabulated Q values disagree.
    reaction label 32: He4 + Sr87_e6 (Error # 0): Q mismatch

    ```
    WARNING: Calculated and tabulated Q-values disagree: 37713.28472900391 eV vs 1.4e4 eV!
    ```

23. Calculated and tabulated Q values disagree.
    reaction label 33: He4 + Sr87_e7 (Error # 0): Q mismatch

    ```
    WARNING: Calculated and tabulated Q-values disagree: 9253.284729003906 eV vs -14460. eV!
    ```

24. Energy range of data set does not match cross section range
    *reaction label 33: He4 + Sr87_e7 / Product: He4 / Distribution: / angularTwoBody -
    XYs2d: (Error # 0): Domain mismatch (a)*

    ```
    WARNING: Domain doesn't match the cross section domain: (14622.2 -> 20000000.0) vs (14622.23 -> 20000000.0)
    ```

25. Calculated and tabulated Q values disagree.
    reaction label 34: He4 + Sr87_e8 (Error # 0): Q mismatch

    ```
    WARNING: Calculated and tabulated Q-values disagree: -140766.7152709961 eV vs -164480. eV!
    ```

26. Calculated and tabulated Q values disagree.
    reaction label 35: He4 + (Sr87_c ->Sr87 + gamma) (Error # 0): Q mismatch

    ```
    WARNING: Calculated and tabulated Q-values disagree: -140766.7152709961 eV vs -164480. eV!
    ```

12

27. Calculated and tabulated Q values disagree.
reaction label 36: Zr91 + gamma (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: 7213382.260131836 eV vs 7.194e6 eV!
```

28. Calculated and tabulated Q values disagree.
reaction label 37: n + He4 + Sr86 + gamma (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -6648440.884246826 eV vs -6.671e6 eV!
```

29. Calculated and tabulated Q values disagree.
reaction label 38: H1 + He4 + Rb86 + gamma (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -7642204.005142212 eV vs -7.664e6 eV!
```

30. Calculated and tabulated Q values disagree.
reaction label 39: H2 + (Y89_s ->Y89 + gamma) (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -6114916.924530029 eV vs -6.131e6 eV!
```

31. Energy range of data set does not match cross section range
reaction label 39: H2 + (Y89_s ->Y89 + gamma) / Product: H2 / Distribution: / uncorrelated - energy - XYs2d: (Error # 0): Domain mismatch (a)

```
WARNING: Domain doesn't match the cross section domain: (6199790.0 -> 20000000.0) vs (6199785.0 -> 20000000.0)
```

32. Energy range of data set does not match cross section range
reaction label 39: H2 + (Y89_s ->Y89 + gamma) / Product: Y89_s / Decay product: gamma / Multiplicity: (Error # 0): Domain mismatch (a)

```
WARNING: Domain doesn't match the cross section domain: (6199790.0 -> 20000000.0) vs (6199785.0 -> 20000000.0)
```

33. Energy range of data set does not match cross section range
reaction label 39: H2 + (Y89_s ->Y89 + gamma) / Product: Y89_s / Distribution: / uncorrelated - angular - isotropic: (Error # 0): Domain mismatch (a)

```
WARNING: Domain doesn't match the cross section domain: (6199790.0 -> 20000000.0) vs (6199785.0 -> 20000000.0)
```

34. Energy range of data set does not match cross section range
reaction label 39: H2 + (Y89_s ->Y89 + gamma) / Product: Y89_s / uncorrelated - energy - XYs2d: (Error # 0): Domain mismatch (a)

```
WARNING: Domain doesn't match the cross section domain: (6199790.0 -> 20000000.0) vs (6199785.0 -> 20000000.0)
```

35. Calculated and tabulated Q values disagree.
reaction label 40: H3 + (Y88_s ->Y88 + gamma) (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -11331337.55020142 eV vs -1.135e7 eV!
```

- `njoy2012` Warnings:

    1. Generic warning message
    unresr...calculation of unresolved resonance cross sections (0): Warning

```
      ---message from rdunf2---unresolved-smooth overlap above e=  1.0000E+06
      energy =  2.0000E+05
```

2. Recoil is not given, so one-particle recoil approximation used.
   heatr...prompt kerma (0): HEATR/hinit (4)

```
      ---message from hinit---mf6, mt 16 does not give recoil za= 40089
                             one-particle recoil approx. used.
```

3. Recoil is not given, so one-particle recoil approximation used.
   heatr...prompt kerma (1): HEATR/hinit (4)

```
      ---message from hinit---mf6, mt 22 does not give recoil za= 38086
                             one-particle recoil approx. used.
```

4. Recoil is not given, so one-particle recoil approximation used.
   heatr...prompt kerma (2): HEATR/hinit (4)

```
      ---message from hinit---mf6, mt 28 does not give recoil za= 39089
                             one-particle recoil approx. used.
```

5. Recoil is not given, so one-particle recoil approximation used.
   heatr...prompt kerma (3): HEATR/hinit (4)

```
      ---message from hinit---mf6, mt 91 does not give recoil za= 40090
                             one-particle recoil approx. used.
```

6. Recoil is not given, so one-particle recoil approximation used.
   heatr...prompt kerma (4): HEATR/hinit (4)

```
      ---message from hinit---mf6, mt102 does not give recoil za= 40091
                             photon momentum recoil used.
```

7. Recoil is not given, so one-particle recoil approximation used.
   heatr...prompt kerma (5): HEATR/hinit (4)

```
      ---message from hinit---mf6, mt104 does not give recoil za= 39089
                             one-particle recoil approx. used.
```

8. Recoil is not given, so one-particle recoil approximation used.
   heatr...prompt kerma (6): HEATR/hinit (4)

```
      ---message from hinit---mf6, mt105 does not give recoil za= 39088
                             one-particle recoil approx. used.
```

9. Recoil is not given, so one-particle recoil approximation used.
   heatr...prompt kerma (7): HEATR/hinit (4)

```
      ---message from hinit---mf6, mt112 does not give recoil za= 37086
                             one-particle recoil approx. used.
```

10. Recoil is not given, so one-particle recoil approximation used.
    heatr...prompt kerma (8): HEATR/hinit (4)

```
      ---message from hinit---mf6, mt649 does not give recoil za= 39090
                             one-particle recoil approx. used.
```

14

11. Recoil is not given, so one-particle recoil approximation used.
    heatr...prompt kerma (9): HEATR/hinit (4)

```
 ---message from hinit---mf6, mt849 does not give recoil za= 38087
                         one-particle recoil approx. used.
```